Ordering number:ENN4039

Monolithic Linear IC

LA7957

Video Switch for TV/VCR Use

Overview

The LA7957 is an audio video switch for televisions, VCRs and other video equipment, and for audio and video amplifiers in multimedia equipment.
The LA7957 is ideal for audio and video switching in dual-tuner, BS and PIP applications.
The LA7957 operates from a 12V supply and is available in 20-pin SDIPs.

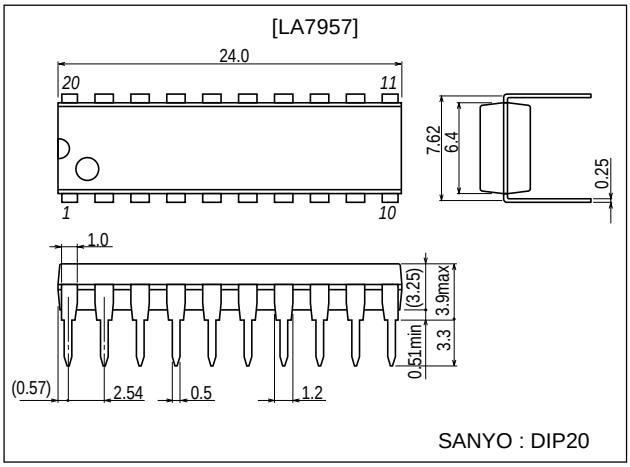
Features

- Suitable for dual tuner, BS and PIP applications.
- Three video inputs.
- Two video outputs.
- Two stereo audio channels.
- Muting of one audio channel.
- 8.0 to 13.2V supply voltage.
- 20-pin SDIPs.

Package Dimensions

unit:mm

3021C-DIP20



Specifications

Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC}		14.4	V
CONT1, CONT2 and MUTEIN voltage	V_I		14.4	V
Allowable power dissipation	Pd max		700	mW
Operating temperature	Topr		–20 to +70	˚C
Storage temperature	Tstg		–55 to +125	˚C

Recommended Operating Conditions at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC}		12	V
Supply voltage range	V_{CC}		8.0 to 13.2	V

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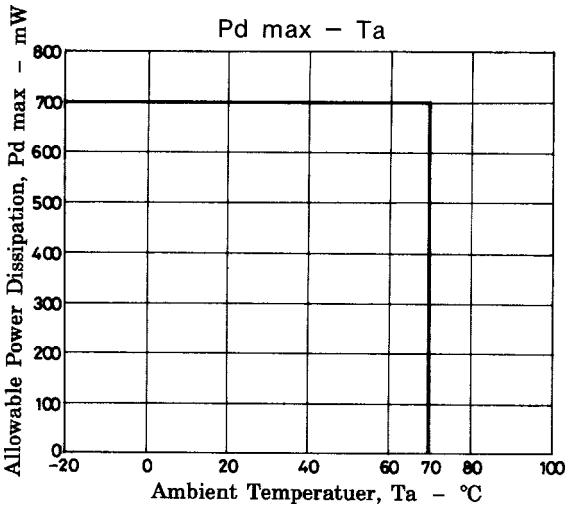
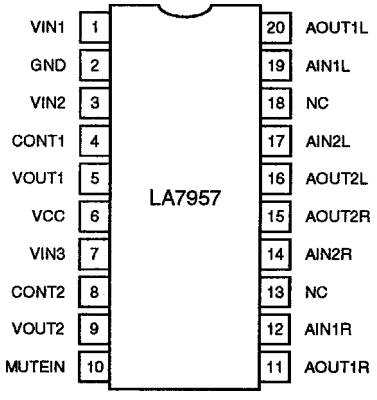
Operating Characteristics at Ta = 25˚C, V_{CC}=12V

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current drain	I_{CC}		35	43	57	mA
$V_{IN}1$ to $V_{IN}3$ input bias voltage	V_{IVB}		4.4	4.7	5.0	V
$V_{OUT}1$ and $V_{OUT}2$ otuput bias voltage	V_{OV}		8.2	6.8	7.4	V
$V_{IN}1$ to $V_{IN}3$ input impedance	Z_{IV}	f=1kHz	15	21	27	kΩ
		f=1kHz, $V_{IN}3$ connected to $V_{IN}2$		10.5		kΩ
Video-channel voltage gain	A_V	V_I=1Vp-p sine wave, f=0.1MHz	5.6	6.1	6.6	dB
Video-channel bandwidth	BW_V	V_I=0.7Vp-p sine wave, 0.1MHz to the –3dB point	10			MHz
Video-channel noise voltage	V_{NV}	Rg=75Ω, 10MHz bandwidth		0.3	1.0	mVrms
$V_{IN}1$ to $V_{IN}2$ crosstalk rejection	CT_{V1}	Rg=75Ω, f=3.58MHz	45	50		dB
$V_{IN}1$ to $V_{IN}3$ or $V_{IN}2$ to $V_{IN}3$ crosstalk rejectioln	CT_{V2}	Rg=75Ω, f=3.58MHz	45	50		dB
Video-channel hum rejection	HR_V	f=50Hz, Rg=75Ω	18	23		dB
AIN1L, AIN1R, AIN2L and AIN2R input bias voltage	V_{IAB}		4.5	5.1	5.7	V
AOUT1 and AOUT2 output bias voltage	V_{OA}		3.2	3.8	4.4	V
AIN1L and AIN1R input impedance	Z_{IA1}	f=1kHz	47	68	88	kΩ
AIN2L and AIN2R input impedance	Z_{IA2}	f=1kHz	51	74	95	kΩ
Audio-channel voltage gain	A_A	f=1kHz, V_I=500mVrms	–0.5	–0.02	+0.5	dB
Audio-channel bandwidth	BW_A	V_I=500mVrms, 1kHz to the –1dB point	100			kHz
Audio-channel total harmonic distortion	THD	V_I=500mVrms, f-1kHz		0.03	0.2	%
Audio-channel noise voltage	V_{NA}	Rg=600Ω, f=20Hz to 20kHz		10	50	µVms
AIN1 to AIN2 crosstalk rejection	CT_{A1}	Rg=4.7kΩ, f≤1kHz	75	90		dB
Left-to right-channel crosstalk rejection	CT_{AS}	Rg=4.7kΩ, f≤1kHz	72	82		dB
Mute output noise voltage	V_{OAM}	V_I=500mVrms, f=1kHz		0.02	0.1	mVrms
Audio-channel hum rejection	HR_A	Rg=4.7kΩ	40	46		dB
		Input open or mute ON	28	39		dB
CONT1 and CONT2 HIGH-level input voltage	V_{IH1}		1.1	1.4	1.7	V
CONT1 leakage current	I_{L1}	V_{CONT1}=0V			–3	µA
CONT2 leakage current	I_{L2}	V_{CONT2}=0V			–3	µA
MUTEIN HIGH-level input voltage	V_{IH2}		1.1	1.4	1.7	V
MUTEIN leakage current	I_{L3}	V_{MUTEIN}=0V			–3	µA

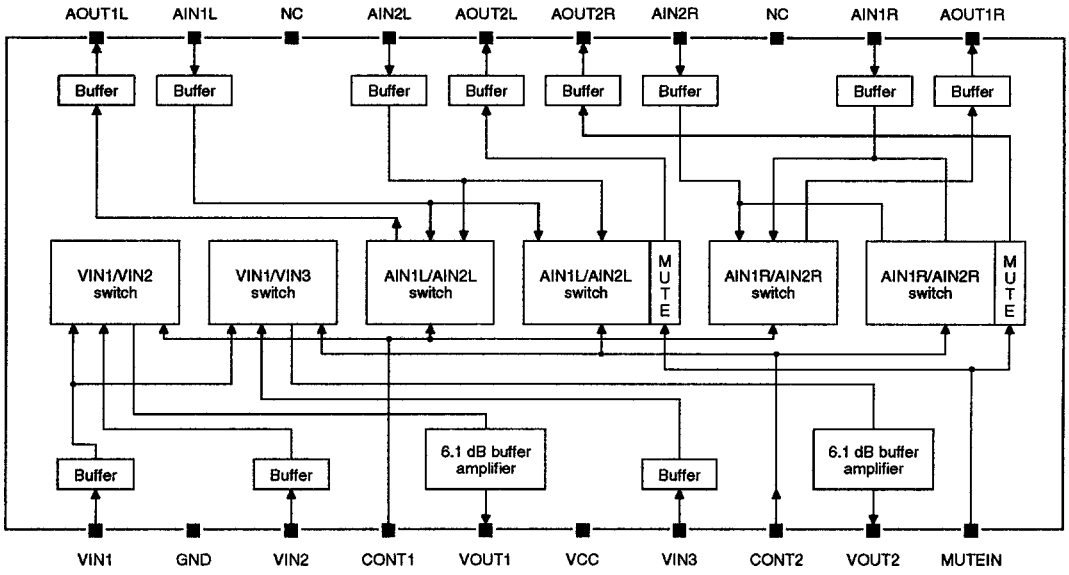


Pin Assignment



Top view

Block Diagram



Pin Functions

Number	Name	Description
1	$V_{IN}1$	Video input channel 1
2	GND	Ground
3	$V_{IN}2$	Video input channel 2
4	CONT1	Video and audio channel 1 source select input
5	VOUT1	Video output channel 1
6	V_{CC}	Supply voltage
7	$V_{IN}3$	Video input channel 3
8	CONT2	Video and audio channel 2 source select input
9	VOUT2	Video output channel 2
10	MUTEIN	Mute control input
11	AOUT1R	Audio channel 1 right-channel output
12	AIN1R	Audio channel 1 right-channel input
13	NC	No connection
14	AIN2R	Audio channel 2 right-channel input
15	AOUT2R	Audio channel 2 right-channel output
16	AOUT2L	Audio channel 2 left-channel output
17	AIN2L	Audio channel 2 left-channel input
18	NC	No connection
19	AIN1L	Audio channel 1 left-channel input
20	AOUT1L	Audio channel 1 left-channel output

Output Selection

CONT1	CONT2	MUTEIN	VOUT1	VOUT2	AOUT1L/R	AOUT2L/R
LOW	LOW	LOW	$V_{IN}1$	$V_{IN}1$	AIN1L/R	AIN1L/R
LOW	HIGH	LOW	$V_{IN}1$	$V_{IN}3$	AIN1L/R	AIN2L/R
HIGH	LOW	LOW	$V_{IN}2$	$V_{IN}1$	AIN2L/R	AIN1L/R
HIGH	HIGH	LOW	$V_{IN}2$	$V_{IN}3$	AIN2L/R	AIN2L/R
LOW	LOW	HIGH	$V_{IN}1$	$V_{IN}1$	AIN1L/R	–
LOW	HIGH	HIGH	$V_{IN}1$	$V_{IN}3$	AIN1L/R	–
HIGH	LOW	HIGH	$V_{IN}2$	$V_{IN}1$	AIN2L/R	–
HIGH	HIGH	HIGH	$V_{IN}2$	$V_{IN}3$	AIN2L/R	–

Note
When using the two-input, two-output configuration, $V_{IN}2$ and $V_{IN}3$ should be connected externally.